

**REMARKS**

The Office Action mailed May 10, 2005, has been received and reviewed. Claims 1 through 46 are currently pending in the application, of which claims 26 through 46 are currently under examination. Claims 1 through 25 are withdrawn from consideration as being drawn to a non-elected invention. Claims 26, 27, 30 through 38 and 40 stand rejected. Claims 28, 29, 39, and 41 through 46 have been objected to as being dependent upon rejected base claims, but the indication of allowable subject matter in such claims is noted with appreciation. Applicants have amended claims 26, 33, 38, and 41, and respectfully request reconsideration of the application as amended herein. Applicants have also canceled claims 1 through 25, without prejudice to the filing of one or more divisional applications including same.

**Erroneous Citation of references on PTO-1449 Form from an Unrelated Application**

A PTO-1449 form was received which indicates the Applicant as Jacob Hall and the Attorney Docket Number as FPO-CE-23029 (108454-1). Applicants respectfully submit that this PTO-1449 form does not belong to the present application or any related application and request that it be removed from the file and the documents cited thereon be removed from the record of the present application. A copy of the incorrectly cited PTO-1449 form marked "COPY" in red is enclosed for the Examiner's convenience in identifying same in the Office file for the present application.

**35 U.S.C. § 102(b) Anticipation Rejections**

**Anticipation Rejection Based on U.S. Patent No. 6,049,129 to Yew et al.**

Claims 26, 27, 30, 32, 36, 38 and 40 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Yew et al. (U.S. Patent No. 6,049,129). Applicants respectfully traverse this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention

must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

It is respectfully submitted that, under 35 U.S.C. § 102(b), independent claim 26, as amended, recites subject matter which is allowable over that described in Yew, et al.

U.S. Patent 6,049,129 to Yew, et al. (hereinafter “Yew”) describes a silicon chip where “bonding pads 120 are connected to routing strips 82 and bus bars 110 by wire bonding 80.” Yew, col. 5, lines 16-18. Yew does not expressly or inherently describe or disclose wire bonds extending between and, thus connecting bond pads with conductive bumps. To the contrary, Yew teaches that the bonding pads 120 are connected by wire bonds 80 to routing strips (traces) 82 that are connected to vias 84, which are connected to pads 100, which are finally connected to conductive bumps 150. The above-referenced application differs from Yew and other prior art in the fact that, in one exemplary embodiment, the anisotropic layer forms an areal bonding pad where conductive bumps may be bonded at any location thereon, thus enabling wire bonding directly from the bonding pads to the conductive bumps and avoiding the overly complex structure of Yew.

Additionally, Yew lacks any express or inherent description or disclosure of an anisotropically conductive material whatsoever. One of ordinary skill in the art would recognize the term of art “anisotropically conductive material” as meaning a material with conductive properties that differ according to direction. Placing a conductive via transversely through a nonconductive material may allow for conduction of electricity in a single direction, but it does not make the resulting structure an anisotropically conductive material as that term is used in the art. One of ordinary skill in the art would be familiar with commercial anisotropically conductive products available as strips of tape or films and would not confuse a strip of anisotropically conductive tape or film as being equivalent to a conductive via formed through a printed circuit board. Consequently, Yew neither expressly nor inherently describes nor discloses an anisotropically conductive material.

Accordingly, Yew does not anticipate claim 26.

Each of claims 27, 30, 32, 36, 38, and 40 is allowable, among other reasons, for depending either directly or indirectly from claim 26, which is allowable.

Claim 27 is additionally allowable because the above-referenced application describes metal columns embedded in a “polymeric material” whereas in Yew, the metal columns or vias 84 are etched into printed circuit boards. Yew goes on to suggest that these printed circuit boards be made out of FR4 (Yew, Col. 3, lines 58-62) that is a form of fire retardant fiber glass which is a woven material and not a polymeric material. Thus, claim 27 is not anticipated.

Claim 30 should be allowed because a “tape or film” is typically known in the art as a thin substrate or coating. Yew does not expressly or inherently describe or disclose a tape or film. To the contrary, Yew describes a rigid, multi-layer printed circuit board that forms an essential structural component of the semiconductor substrate assembly. Thus, claim 30 is not anticipated.

Claim 30 is additionally allowable, among other reasons, for depending directly from claim 27, which is allowable for the above-stated reasons.

Claim 32 is additionally allowable as Yew fails to describe an anisotropically conductive layer attached to an active surface of a semiconductor die by an adhesive. Element 70 of Yew is a three-layer (72, 74, 76) printed circuit board, not an anisotropically conductive layer.

For these reasons, withdrawal of the 35 U.S.C. § 102(b) rejections of claims 26, 27, 30, 32, 36, 38, and 40 is respectfully solicited.

### **35 U.S.C. § 103(a) Obviousness Rejections**

#### Obviousness Rejection Based on U.S. Patent No. 6,049,129 to Yew et al. in view of U.S. Patent No. 5,858,816 to Sato

Claim 31 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Yew et al. (U.S. Patent No. 6,049,129) in view of Sato (U.S. Patent No. 5,858,816). Applicants respectfully traverse this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or**

**references when combined) must teach or suggest all the claim limitations.**

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

Claim 31 is allowable as depending from claim 26, which is allowable. Sato fails to cure the deficiencies in the description of Yew, as set forth above with respect to claim 26.

Obviousness Rejection Based on U.S. Patent No. 6,049,129 to Yew et al. in view of U.S. Patent No. 5,796,170 to Marcantonio

Claims 33 and 34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yew et al. (U.S. Patent No. 6,049,129) in view of Marcantonio (U.S. Patent No. 5,796,170). Applicants respectfully traverse this rejection, as hereinafter set forth.

Claims 33 and 34 are allowable as depending from claim 26.

Further, the combination of Yew and Marcantonio does not teach or suggest all claim limitations of claim 33. The Examiner asserts that Figure 3 of Marcantonio shows wire bonds 118 "between" a plurality of conductive bumps and a plurality of terminal pads. However, Marcantonio clearly illustrates and confirms in his specification at Col. 4, lines 32-40, by reference to Col. 4, lines 9-15, that elements 118 are "conductive leads" which connect bond pads 116 to conductive traces 120. Claim 33, as amended, clearly requires wire bonds extending between the plurality of conductive bumps and the plurality of terminal pads of the substrate. Accordingly, the combination of Yew and Marcantonio fails to teach or suggest every element of claim 34.

Claim 34 is allowable, among other reasons, for depending either directly or indirectly from claims 26 and 33, which are allowable.

Obviousness Rejection Based on U.S. Patent No. 6,049,129 to Yew et al. in view of U.S. Patent No. 6,806,560 to Kobayashi

Claim 35 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Yew et al. (U.S. Patent No. 6,049,129) in view of Kobayashi (U.S. Patent No. 6,806,560). Applicants respectfully traverse this rejection, as hereinafter set forth.

The combination of Yew and Kobayashi does not teach or suggest all claim limitations of claim 35. Figure 2D of Kobayashi shows a flip-chip configuration where the underfill material 32 surrounds the conductive bumps 24 after they have been electrically bonded to a printed circuit board 30. The semiconductor substrate assembly of claim 35 is not recited to be in a flip-chip configuration and the conductive bumps are not bonded to a printed circuit board.

Moreover, the combination of references fails to teach or suggest a structure wherein an assembly of wire bonds extending between bond pads and conductive bumps is covered by a dielectric material.

Further, since the semiconductor substrate assembly recited in claim 35 is not a flip-chip configuration, then there is no motivation to modify Yew with Kobayashi and cover the conductive bumps with a dielectric layer to absorb stress caused by a difference in the thermal expansion coefficient between the semiconductor and the printed circuit board because the printed circuit board is not a recited part of the assembly. Further, disposing a dielectric layer over the conductive bumps in the apparatus as claimed based on the Examiner's reasoning would render it inoperative since the covered conductive bumps as claimed would be unable to make an electrical connection in a flip-chip configuration.

Claim 35 is additionally allowable, among other reasons, for depending either directly or indirectly from claims 26 and 32, which are allowable.

Obviousness Rejection Based on U.S. Patent No. 6,049,129 to Yew et al. in view of U.S. Patent No. 6,727,519 to Wu

Claim 37 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Yew et al. (U.S. Patent No. 6,049,129) in view of Wu (U.S. Patent No. 6,727,519). Applicants respectfully traverse this rejection. Claim 37 is allowable as depending from claim 26, which is allowable.

For these reasons, withdrawal of the 35 U.S.C. § 103(a) rejections of claims 31, 33, 34, 35, and 37 is respectfully solicited.

**Allowable Subject Matter**

Claims 28, 29, 39, 41 through 46 stand objected to as being dependent upon rejected base claims, but are indicated to contain allowable subject matter and would be allowable if placed in appropriate independent form. Claims 28 and 29 are allowable as depending from claim 26. Claims 38 and 41 have been placed in independent form and claims 42 through 46 depend from claim 41.

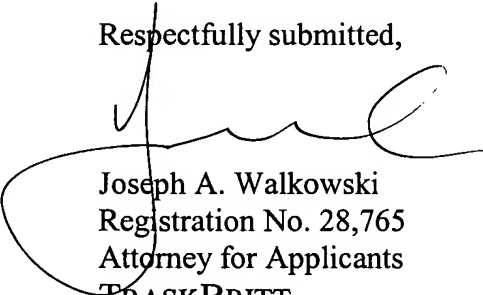
### ENTRY OF AMENDMENTS

The amendments to claims 26, 33, 38, and 41 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. Further, the amendments do not raise new issues or require a further search. These amendments should not be construed as limiting the scope of the claims but merely as clarifications for the Examiner's convenience.

### CONCLUSION

Claims 26 through 38 and 41 through 46 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Joe Walkowski', is written over the typed name and address.

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